

AMENDMENTS TO THE CLAIMS

Claim 1. (Currently Amended) A process for preparing an aqueous polymer dispersion by mini-emulsion polymerisation, the process comprising the steps of

- (a) forming a mixture comprising:
 - (i) water;
 - (ii) at least one amphiphilic stabilising polymer of number average molecular weight (M_n) from about 800 to about 100,000 daltons and an acid number from about 50 to about 400 mg KOH/g;
 - (iii) at least one hydrophobic co-stabiliser; and
 - (iv) at least one α,β -ethylenically unsaturated monomer;where the mixture comprises no more than about 2% by weight of the monomer of the total amount of any further ingredient(s) which act as a surfactant in the mixture;
- (b) applying high stress to the mixture from step (a) to form an essentially stable mini-emulsion comprising an aqueous continuous phase and dispersed therein stabilised droplets of average diameter from about 10 to about 1000 nm, the droplets comprising the hydrophobic co-stabiliser and the monomer
- (c) polymerising the monomer within the droplets.

Claim 2. (Original) A process according to the preceding claim, in which in step (a) the mixture is formed by mixing a first (aqueous) pre-mixture comprising the amphiphilic stabilising polymer and water with a second (organic) pre-mixture comprising the hydrophobic co-stabiliser and the α,β -ethylenically unsaturated monomer.

Claim 3. (Original) A process according to claim 2, in which a polymerisation initiator is incorporated (optionally dissolved) in the second pre-mixture.

Claim 4. (Currently Amended) A process according to ~~any preceding~~ claim 1 where the amphiphilic stabilising polymer is a polymer derived from a combination of hydrophobic monomers and hydrophilic monomers which comprise acid functions or functions leading thereto.

Claim 5. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the amphiphilic stabilising polymer comprises copolymer(s) derived from styrene and maleic anhydride and/or from styrene, α -methyl styrene and acrylic acid.

Claim 6. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the amphiphilic stabilising polymer has a solubility in the aqueous phase measured at 25°C of at least about 1×10^{-2} g/l.

Claim 7. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the amount of amphiphilic stabilising polymer used is from about 0.5% to about 15 % by weight relative to the total weight of α, β -ethylenically unsaturated monomer(s).

Claim 8. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the hydrophobic co-stabiliser has a solubility in water, measured at 25°C, of less than about 5×10^{-5} g/l.

Claim 9. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the hydrophobic co-stabiliser is selected from the group consisting of: C_{12-14} alkanes, C_{12-14} alcohols, C_{18-22} acrylates and mixtures thereof.

Claim 10. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the hydrophobic co-stabiliser is used in an amount from about 0.05% to about 40% by weight based on the total weight of the mixture prepared in step (a).

Claim 11. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the α,β -ethylenically unsaturated monomer has a solubility in water, measured at 25°C, of less than about 15%.

Claim 12. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the α,β -ethylenically unsaturated monomer is selected from the group consisting of: styrenes, acrylates, methacrylates, vinyl and vinylidene halides, dienes, vinyl esters and mixtures thereof.

Claim 13. (Currently Amended) A process according to ~~any preceding~~ claim 1, where one or more water-soluble monomer(s) having a water solubility, measured at 25°C, higher than about 15% are added to the mixture of step (a) in an amount less than about 6% by weight of the total monomer(s).

Claim 14. (Currently Amended) A process according to ~~any preceding~~ claim 1, where one or more components that modify the pH are added to the mixture formed in step (a).

Claim 15. (Currently Amended) A process according to ~~any preceding~~ claim 1, where step (b) produces a mini-emulsion comprising stabilised droplets having an average diameter from about 50 nm to about 500 nm.

Claim 16. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the high stress in step (b) is applied by equipment that produces localised high shear, optionally in combination with moderate bulk mixing.

Claim 17. (Currently Amended) A process according to ~~any preceding~~ claim 1, where the monomer within the droplets is polymerised in the presence of a free radical initiator.

Claim 18. (Currently Amended) A stable aqueous polymer dispersion obtained and/or obtainable indirectly and/or directly by a process as claimed in ~~any preceding~~ claim 1.

Claim 19. (Original) A stable aqueous polymer dispersion comprising a matrix of polymer particles formed from at least one α,β -ethylenically unsaturated monomer, the particles having an average diameter from about 10 to about 1000 nm, and homogenously dispersed with the polymer matrix there is: (i) at least one amphiphilic stabilising polymer of number average molecular weight (M_n) from about 800 to about 100,000 daltons and an acid number from about 50 to about 400 mg KOH/g; and (ii) optionally at least one hydrophobic co-stabiliser; where the polymer matrix:

Claim 20. (Canceled)

Claim 21. (Currently Amended) A coating; film, adhesive and/or ink composition obtained and/or obtainable using a polymer dispersion as claimed in ~~either~~ claim 18 ~~or 19~~.

Claim 22. (New) A coating; film, adhesive and/or ink composition obtained and/or obtainable using a polymer dispersion as claimed in claim 19.